

# ACNET and Shot Setup

**"JJ" Schmidt**

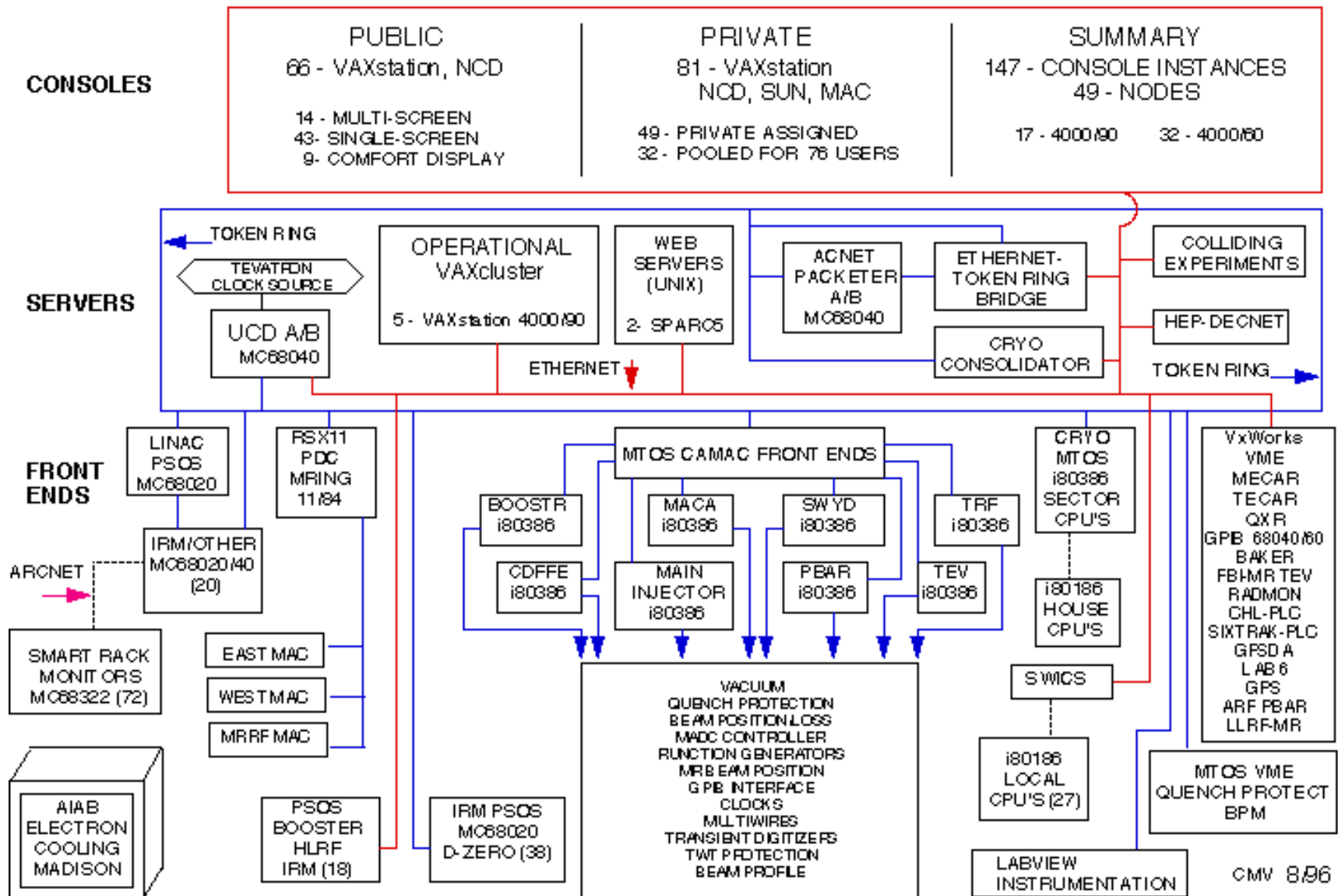
**Ace Training  
June 2<sup>nd</sup> 2004**

# What is ACNET ?

- Accelerator Network
  - AcNet includes hardware, software, protocol for exchanging information,....
- Developed by the FNAL Controls Group
- Monitor and control devices throughout the accelerator and experimental areas
  - Beam currents
  - Luminosity
  - Losses
  - Over 100,000 devices total !
- Records historical information in “dataloggers”

- ACNET control/monitoring software runs on VAXes (VMS) and can create a virtual display console on machines running X-Windows. The VAXes are called consoles. CDF uses Windows 2000 PCs for the display machines.
- If interface seems unusual, it might have to do with the fact that ACNET was developed in the early 1980's to run on PDP-11's (and later on micro-Vaxes).
- But the best way to learn is hands-on practice with old ACE or other expert (like Steve Hahn!) looking over your shoulder. You can experiment a moderate amount but don't get too carried away – it is possible to turn off the Tevatron from ACNET.
- Our ACNET display PCs are physically connected to a Beams Division network. (and speaking of networks...)

# FERMILAB ACCELERATOR CONTROL SYSTEM



# Starting ACNET

- ACNET display runs on PCs on the West side of the Control Room
  - racks 2RR03G and 2RR05B – and in 1<sup>st</sup> floor counting room.
- Should already be running.
- **Automatically starts after reboot** (one way to recover from a problem). (Be patient – it takes a few minutes.)
- If it crashes or is unresponsive, do this to get it going again:
  - **START**
    - Programs
    - Acnet
    - Cnsrun

# Navigating in ACNET

- You will type wherever the cursor is.
- Move the cursor over the character where you want to type.
- Left mouse button works like “return” (text changes color).
- On index page, either click on the page number, or type in Top Left Corner.
- To get back to the index page, type letter of desired index page in the Top Left Corner.

## Many Index Pages

**B** – Booster

**C** – Collider

**D** – Diagnostic/Utility

**E** – Experimental

**I** – Main Injector

**L** – Linac

**P** – PBar

**R** – Recycler

**T** – Tevatron

# Some Useful and Essential Pages

- Essential

- E11 E-Z Writer – livetime plots
- D44 Lumberjack Plotter – plot stored data
- E8 Downtime Data Logger

- Useful

- E2 SVX Loss Monitor
- E6 Silicon Radiation Monitoring
- E7 Monitor Store
- C65 Collider Luminosity
- E9 Examine Database (look up ACNET variables)

# WHAT YOU NEED TO LEARN

- How to make real-time plots using E-Z writer E11
- How to make plots of historical data using the Lumberjack data logger page D44
- How to paste plots in the eLog
  - See <http://www-cdfonline.fnal.gov/ace2help/screenshot.html>
- How to record SVRAD totals at beginning of store
  - See “eLog Entry Help” on Monitoring Ace Page
- How to make a BLM summary plot after a beam incident.
  - See <http://www-cdfonline.fnal.gov/~svxii/runii/quench.html>
- How to use the Downtime Logger E8
  - For categorizing auto-entries
  - For making a “Store” entry

Make sure “old” ACEs teach you these items. (This talk only includes 2 slides on Downtime Logger.)



# Page E8 – CDF Downtime data Logger

- When data-taking stops for more than 2 minutes, an entry is generated automatically.
- Shift crew must edit to categorize downtime (HV, DAQ, Trigger, Level3, etc etc)
- VERY important to categorize downtime according to the underlying cause. (Just because the DAQ system stops taking data doesn't mean DAQ is the cause.)
- VERY important to do this on your shift while you have a good memory of the problems that led to downtime. Involve the SciCo if necessary.
- Allows for downtime accounting later

# Downtime Logger "STORE" Entry

When a new store goes in, enter as COMMENT.

Not an auto entry, so use ADD ENTRY

FR Downtime Log Entry And Edit. Pgm Tools

◆Command◆ ◆Auto Entry◆ ◆Statistics◆ ◆Plot◆ ◆Manager Functions◆

◆Save◆ ◆Now◆ ◆Pend◆ New Entry ◆Quit◆

down:15-JAN-2002 1619 up:dd-xxx-yyzz bhaw Downtime < >◆Name\_Help◆ 1

Dn	Up	System Mode	Description of Problem
14-JAN-2002	Monday		
2214	2217	CNU HV H	PENDING
=>2222	225		Pick a group please...
2341	234	ACCELERATOR	
2346	235	DATA ACQUISITION	
15-J			COMMENTS
00	STORE		Store info. down = time at low beta. up = end store
00	STORCOM		Store comments.
00	STRSHIFT		Start shift; crew list
01	ENDSHIFT		End shift; Coopump, CDFlump, downtime, beantime
=>02	NOTES		notes for record
03			
0341	035	COMMENTS	
0424	042	TESTS	
0442	045		
0501	0505	HVCNTRL H	cmp cmx trip
0505	0511	HVCNTRL H	cmx trip
=>0613	0633	HVCNTRL H	cmp cmx trip

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Messages

DOWN time is when scraping is complete ( $t_0$  for start of the store). Fill the UP time at the end of store. COMMENT should include store # and initial luminosity.

FR Downtime Log Entry And Edit. Pgm Tools

Command Auto Entry Statistics Plot Manager Functions

Save New Pend New Entry Quit

down:15-JAN-2002 1619 up:dd-mm-yyyy hhmm Downtime <STORE >Name\_Help 1

Store 999 - initial lum 1.5E31

Dn	Up	System Mode	Description of Problem
14-JAN-2002 Monday			
2214	2217	CMU HV H	PENDING
=>2222	2255	NOCATEG H	
2341	2345	CMU HV H	
2346	2356	TRIGLVL2 H L2 Done	timeout
15-JAN-2002 Tuesday			
0012	0018	HVCNTRL H	cmp,cmx trip
0025	0029	HVCNTRL H	CMX, CMP trips
0031	0050	HVCNTRL H	CMX, CMP trips due to high losses
0103	0120	STARTUP H	starting new run
=>0237	0259	STARTUP H	starting new run in order to include muon
0319	0330	HVCNTRL H	CMP CMX trip
0341	0351	STARTUP H	starting new run in order to include silicon
0424	0429	HVCNTRL H	cmx cmp trip
0442	0452	STARTUP H	new run startup
0501	0505	HVCNTRL H	cmp cmx trip
0505	0511	HVCNTRL H	cmx trip
=>0613	0633	HVCNTRL H	cmp cmx trip

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Messages

# ACNET resources

Refer to links under "ACNET-Beam" on the Monitoring Ace  
"IFIX/Detector info/Recovery" page..

<http://www-cdfonline.fnal.gov/mcs/mondoc.html> .

# CDF

## Hardware

### Monitoring Documentation

*John Yoh, J. C. Yun*

CDF iFix Slow	Controls (MCS)	ACNET - Beam	Utilities + Safety	DAQ, Misc
<a href="#">Intro to iFix</a> <a href="#">iFix Problems</a> <a href="#">HV Summary</a> <a href="#">Global Alarms</a>	<a href="#">Web-Server Pics</a> <a href="#">"CRYO" Help Page</a>	<a href="#">Tutorial</a> <a href="#">Shot Setup - RadMon</a> <a href="#">Aces' ACNET plots</a> <a href="#">Beam Quality</a>	<a href="#">Monitoring Ace Page</a>	<a href="#">DAQ Ace info</a> <a href="#">Operations page</a> <a href="#">Detector Guide</a>

# ACNET resources (cont'd)

- **Links from mondoc.html**
  - Tutorial: dated
  - Shot Setup: OK – let us know what is not up-to-date
  - Radmon : OK – let us know what is not up-to-date
  - Aces' Acnet Plot : Good but needs updating
  - Beam Quality: Excellent resource - up-to-date
- **Shift crew resources:**
  - **Bug your overlap ACE buddy, operations manager, JJ, and Steve Hahn !**
- **E9 Examine Database Page**
  - **When you have no idea what the variable is.... (try GOOGLE and then E9)**

# Examine Database E9

E9 Database Dump: Summary page ◆Pgm\_Tools◆

Analog Control	Digital Status	Reading Save/Restore	Setting	Summary Family	Dump
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General:  
Device Name:<T:RFSUMA> Device Index:( 7323)  
Descriptive text:<Pbar RF Sum ) node◆MI1 208 11 ◆  
Analog Alarm Information:  
Alarm Bypass ( NO ) tolerance1( 1 ) alarm present( NO )  
Beam Abort ( NO ) tolerance2( 1.3 )  
Abort Inhibit ( NO ) tolerance type(MIN/MAX )  
Reading Information:  
reading: 1.108 MV/T  
Setting Information: No entry for this device  
setting value:  
Basic Status Information: No entry for this device  
on( ) ready( ) remote( ) positive( ) ramp( )  
Sibling Information:  
next(none ) previous(none ) controlling(none )  
◆Protection Mask◆  
◆SSDR Data◆  
◆Audit Information◆  
◆Virtual Machine Info◆  
Alarm List ( 0 )  
Is Broken ( NO )

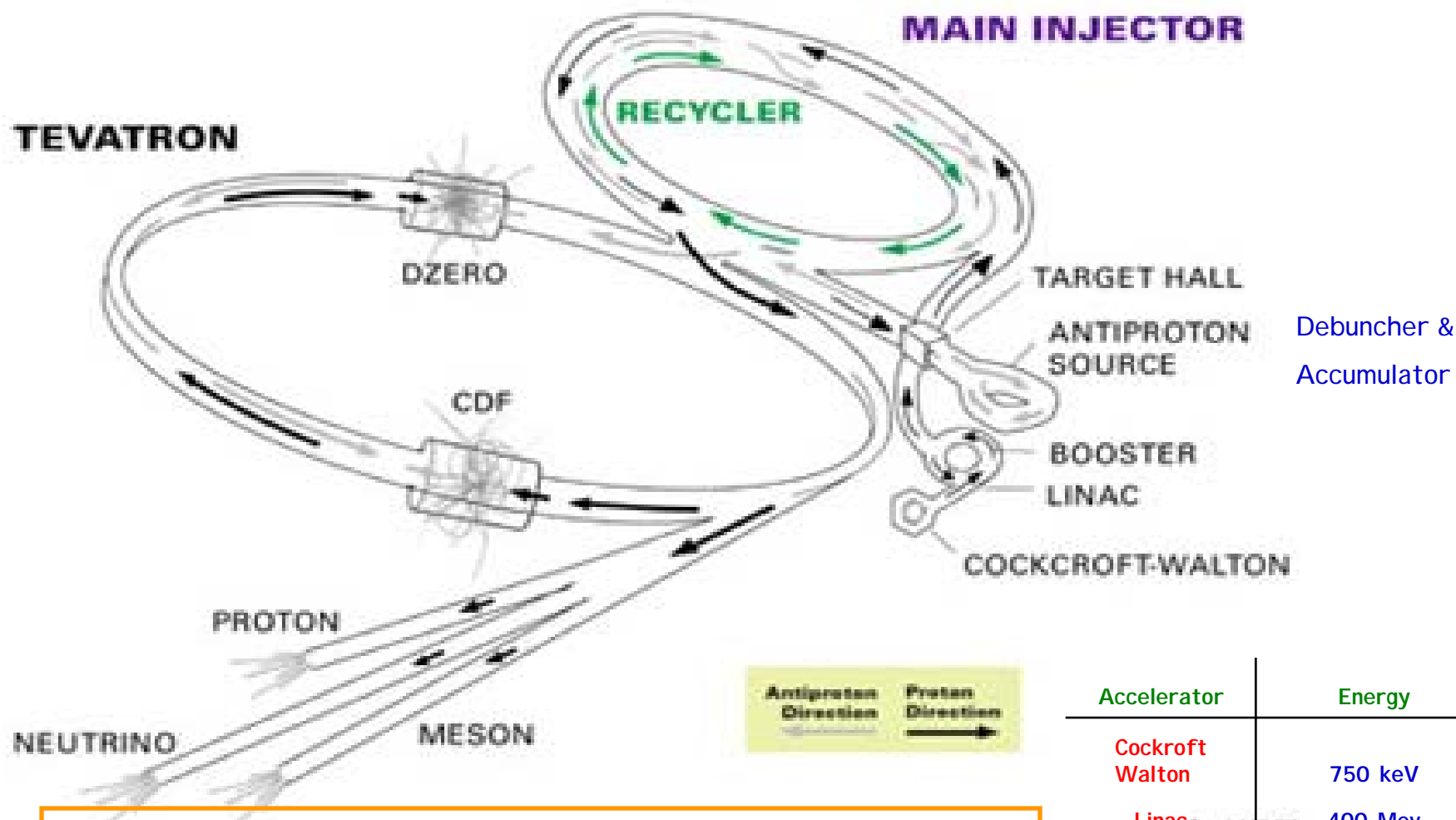
Messages

RFSUMA is not a valid device name  
No matches found for 'RFSUMA'  
is not a valid device name

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p  
n  
+

# SHOT SETUP



Ron Moore will be giving a talk on the accelerator complex during upcoming Tuesday morning Ace Meeting.

Accelerator	Energy
Cockroft Walton	750 keV
Linac	400 MeV
Booster	8 GeV
Main injector	150 GeV
TEVATRON	980 GeV

# Shot Setup Terminology

- **Stacking** – Production and collection of antiprotons into the Accumulator. This operation can take place independent of the Tevatron.
- **Shot Setup** – the sequence of events leading to antiproton shots. Typically takes about 2 hours. I deally would take much less.
- **Shot** – the injection of antiprotons from the Accumulator into the Main Injector and on into the Tevatron in preparation for colliding beams operation.
- **Store** – when there is a steady  $p$ ,  $pbar$  beam present in the Tevatron
  - Numbered sequentially
  - Typically lasts 12-36 hours
  - Can sometimes end abruptly
- In the best of times, CDF takes data continually with a 1-2 hour break once a day to end a store, take some calibrations, and start the next store.



# Shot setup checklist

- **Shot Setup Checklist** is **comprehensive** set of instructions to follow in preparation for a shot and data taking.
- **Special Instructions** – Always check the “White Board” for exceptions and special instructions to follow.
- Current version of checklist is linked from DAQ Ace help page. Please tell Ops Manager about anything that is confusing in the checklist or anything that needs updating.
- **Shot Setup Flowchart** helps DAQ Ace minimize lost beam time during startup. (not currently up-to-date or heavily used)

# Shot setup checklist

Please print out at least one copy at beginning of every shot setup.

## CDF Shot Setup Checklist

NOT CURRENT VERSION

date\_\_\_\_\_ Store#\_\_\_\_\_

[http://www-cdfonline.fnal.gov/opshelp/ShotSetupChecklist\\_v28.html](http://www-cdfonline.fnal.gov/opshelp/ShotSetupChecklist_v28.html)  
Revised 16 June-2003

### Instructions:

- Use this checklist during shot setup. File completed this form in a Shot Setup folder.
- Record entries in the shift elog.
- Recording times in the boxes is useful when communicating information during shift changes.

**1) Before a store (Many steps can be performed simultaneously.)**

Etc...

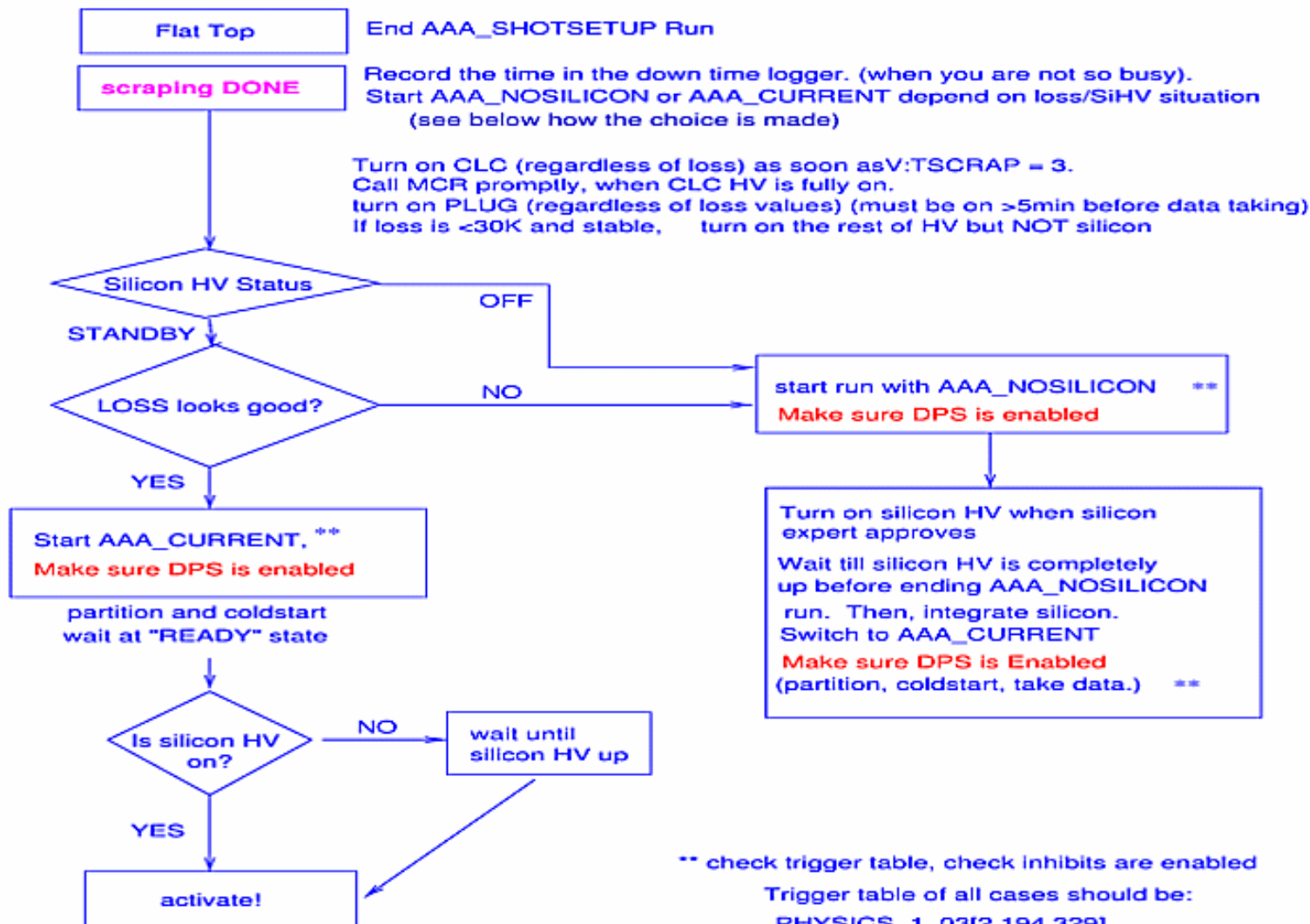
## shotsetup flow chart (with Silicon)

**OUT OF DATE**

- \* when antiproton loading starts, page silicon (218-8227)
- \* should be running AAA\_SHOTSETUP run.

**DPS (dynamic prescale) should be ENABLED for all physics runs.**

**Auto HRR should be ENABLED for all physics runs from the Error Handler GUI.**



Last update: Dec. 13 2002. Kaori

# Store Finale

- At the end of a store:
  - The Main Control Room (MCR) should notify CDF in advance of planned beam dumps.
  - End data taking run
  - Before the store is dumped, ramp down high voltage (allow 5 minutes)
  - SciCo notifies MCR that CDF is ready for store to be terminated.
- For stores that end abnormally with a beam incident:
  - *Usually* what is done is done. If beam is **gone**, most damage is done and you do not have to react instantaneously to problems.
  - Make sure you follow silicon “post quench checkout procedures”  
<http://www-cdfonline.fnal.gov/~svxii/runii/quench.html> .



Like to sing or play an instrument – even if you can not? Talk to Steve about the CDF band – DSDI I.



Like to run even if you can not? Talk to JJ about the CDF “running club” RUN TOO!